

SPoRT

Overview

GOES-R Proving Ground

AWIPS II

Gary Jedlovec

NASA / MSFC, Earth Science Office

<http://weather.msfc.nasa.gov/sport>

<http://weather.msfc.nasa.gov/sportblog>

Short-term Prediction Research and Transition (SPoRT)

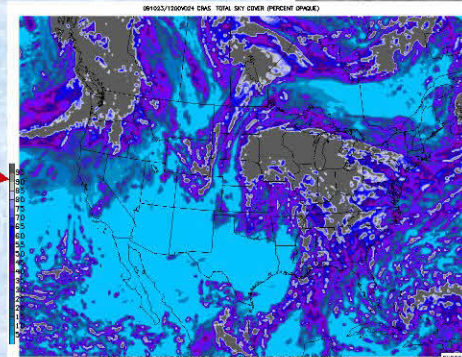


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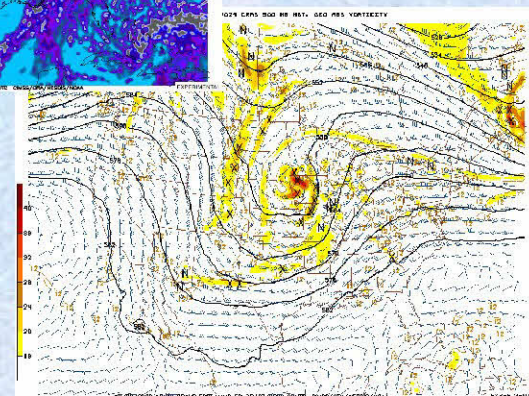


- Forecast IR/WV imagery
- 45km CRAS output in grib2
- Skycover product



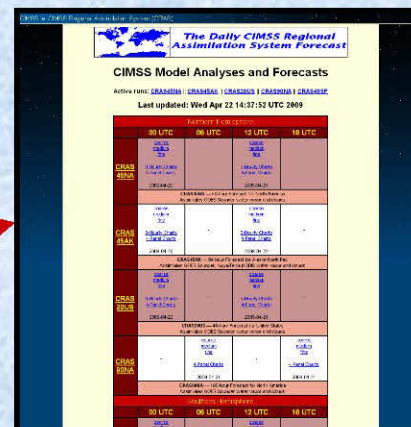
Initialize MKX WRF with CRAS

- Generate parallel run
- Uses GOES sounder
- SSTs from MODIS



New CRAS webpage

- Same format as NCEP
- Gempak graphics



CRAS TEMPESTUS HODIE - Tomorrow's Weather Today

MODIS Applications

Relevance to NWS Forecasters

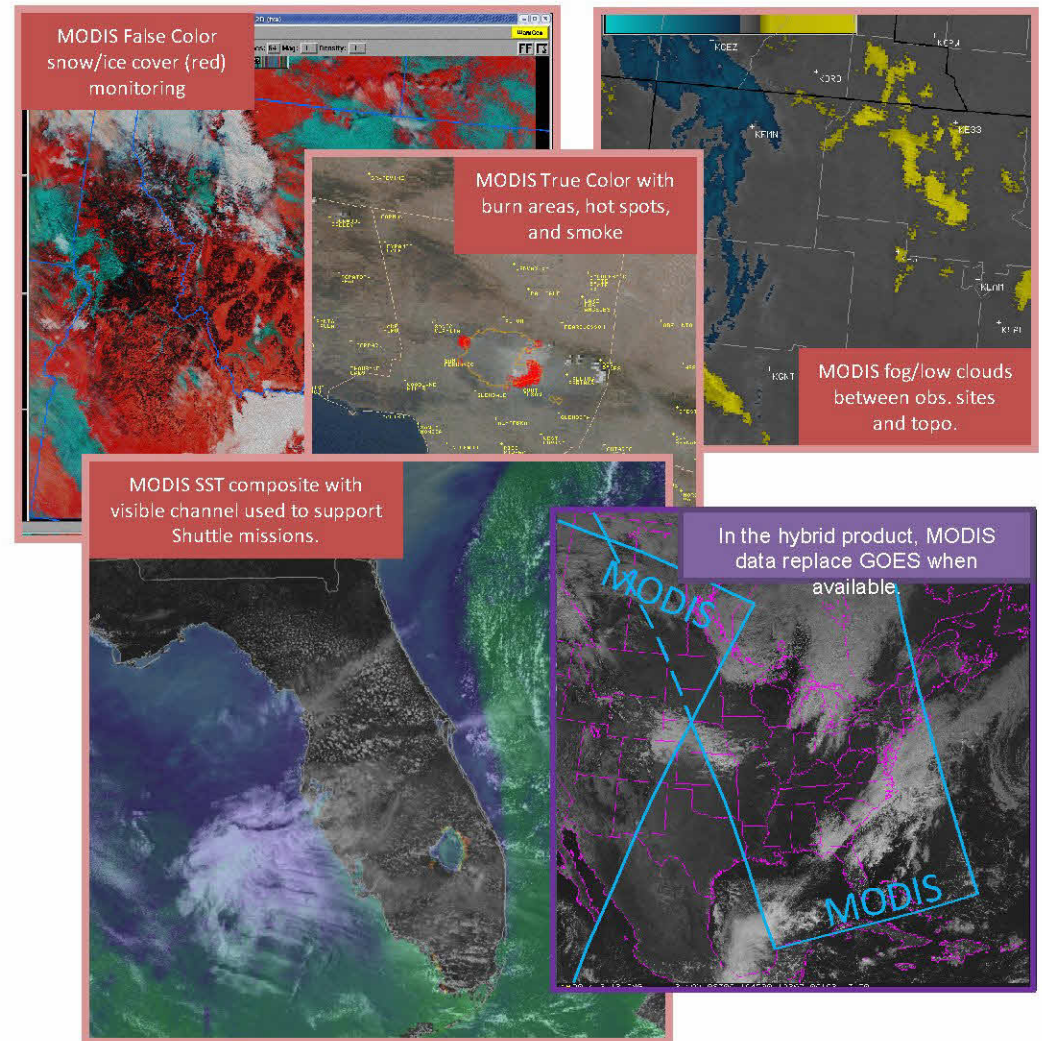
- Address specific forecast problems
- Serves as an introduction to future polar and geostationary products

Unique SPoRT/NASA Contribution

- High resolution visible imagery, false color products, detection of fog in small terrain features, and hot spot detection.

Working on:

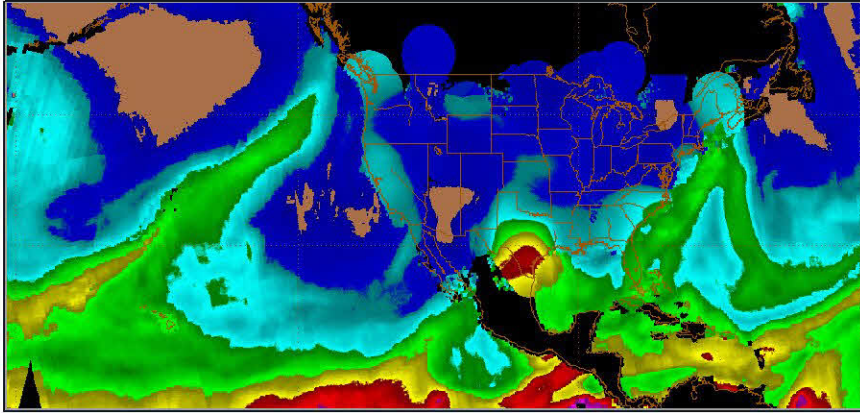
- Blend MODIS and GOES imagery as MODIS becomes available, allowing for a “hybrid” product that demonstrates the value of polar orbiting data.
- Allows for looping of geostationary data but with insertion of higher resolution product when available.



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Blended Products for Data Poor Regions

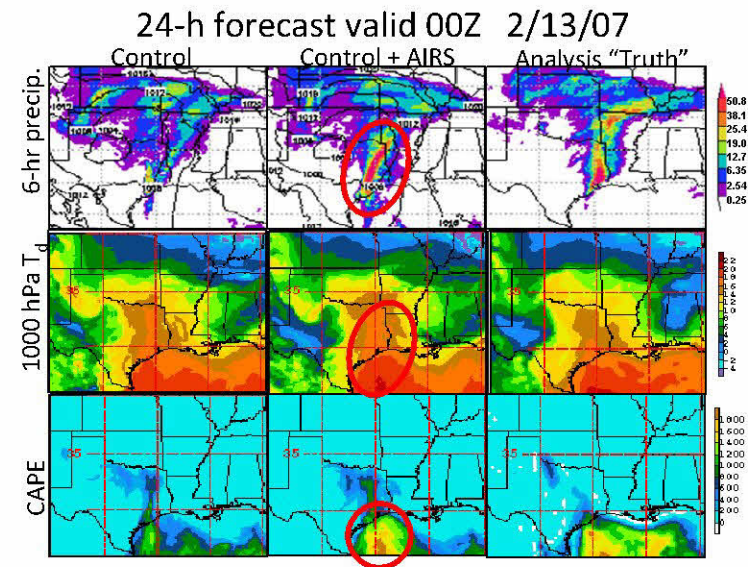


TPW and anomaly product used to monitor atmospheric rivers and moisture sources in data sparse regions (e.g., oceans, SW U.S.)

- provided by CIRA/CSU
 - combined SSM/I, AMSU, GPS obs.
 - 4 times daily
- anomaly is departure from previous week's values
- now NESDIS product in AWIPS

Assimilation of **AIRS temperature and moisture profiles** into WRF has been shown to improve forecast of sensible weather parameters including precipitation

- AIRS profiles data used down to “p-best”
- separate water and land observational errors used in 3DVar
- initial fields provide improved diagnostic analysis and initial conditions for local modeling applications



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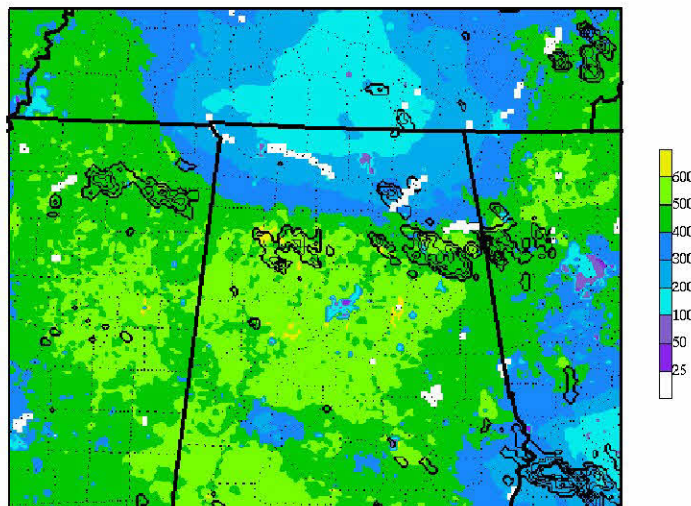


Unique Products, Modeling, and Data Assimilation

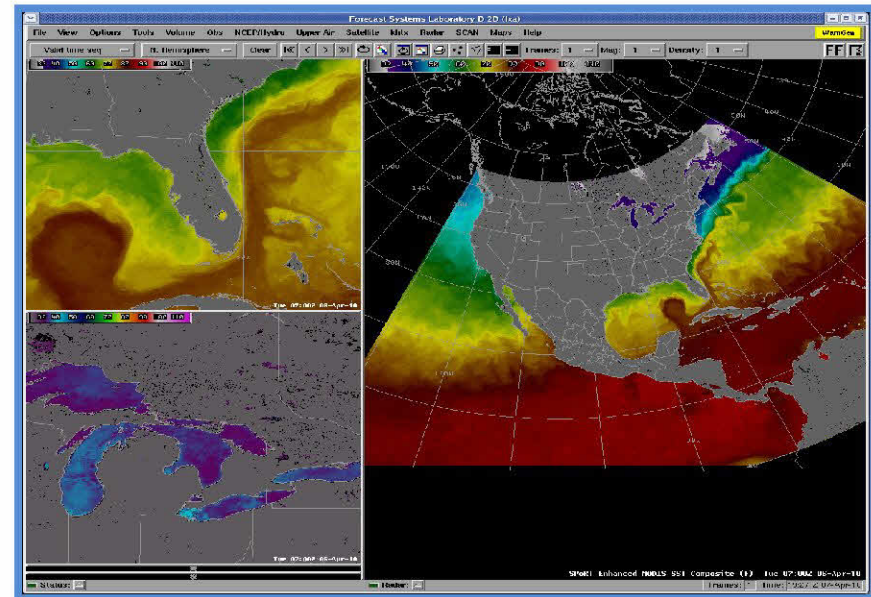
Unique datasets

High resolution MODIS / AMSR-E composite SST fields replaces RTG SST analysis in regional forecast models

- diagnostic applications in AWIPS
- improved regional forecasts in coastal regions
- impact on lake effect snow storms
- available as default SST field in WRF EMS



LIS-Noah Latent Heat Flux (W/m**2) at 090628/1800V000
1-h Rainfall ending 090628/1900V000 (contours)



NASA land surface model and assimilation system provides high resolution soils data – improves QPF and 2m temperature biases in WRF

- driven by MODIS vegetation parameters
- soil moisture variability

Latent and sensible heat fluxes described by LIS can be indicators of convective regions



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Looking to the Future

Continue to demonstrate utility of current and future NASA observations

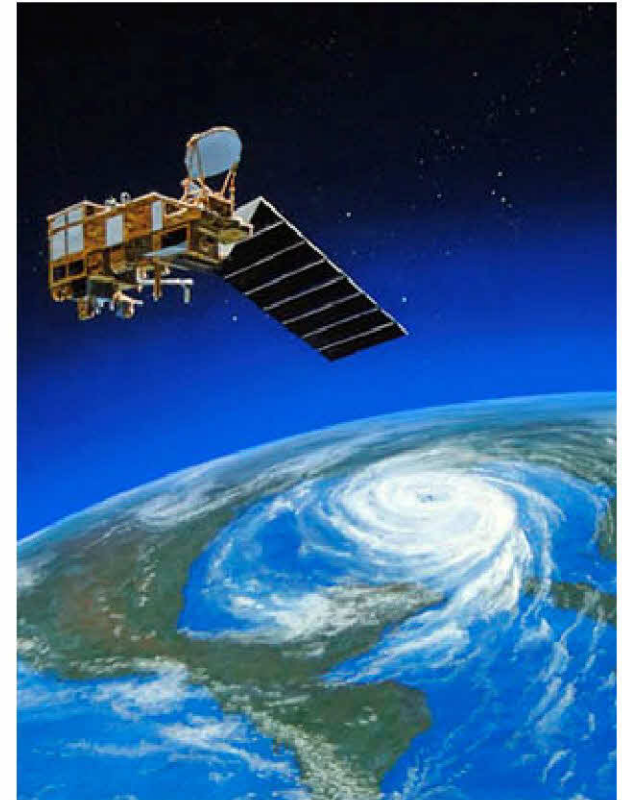
- Collaborations with existing WFOs
 - enhance products to address forecast problems
 - focus projects using observations and WRF/LIS
- Consider expansion to other regions and beyond the NWS

AWIPS II and NPP, NPOESS/JPSS

- Transition current capabilities to AWIPS II
- Demonstrate for NPP by providing VIIRS and CrIMSS (CrIS, ATMS) data and products to WFOs

New NASA and other instruments – GPM, SMAP

Work more with regional centers – NSSL/HWT, HRD/NHC, NCEP/JCSDA



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SPoRT GOES-R Proving Ground

Help with transition of GOES-R products to operational community (e.g., NWS)

Use successful SPoRT paradigm to link product to problem, test and transition, train and assess impact

Focus on strengths – GLM, selected ABI products, AWIPS II, product training and assessment

2009

Participate in GOES-R PG HWT Spring Experiment – forecasters / lightning expertise

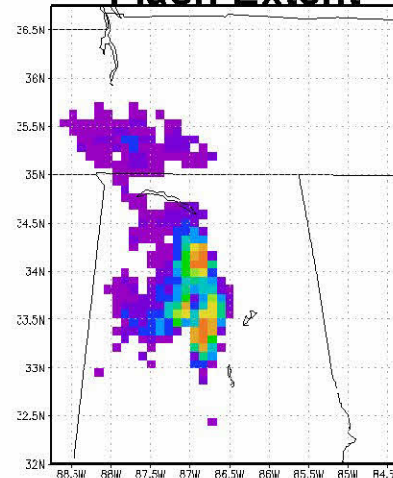
Developed a Pseudo-GLM flash extent density product – multi-network applications

Began AWIPS II Development of a McIDAS Data plugin – GOES, MODIS, etc. imagery

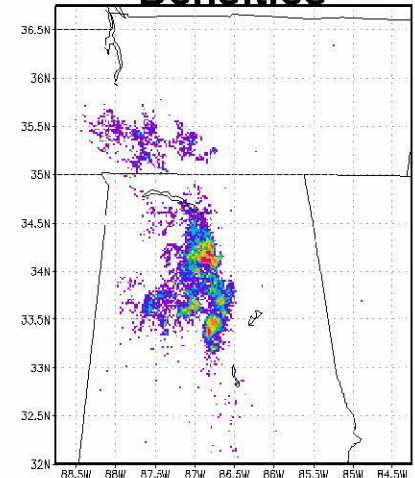
Initiate lightning threat study

Prototype development of a near-real time ABI proxy product from MODIS

**Pseudo GLM
Flash Extent**



**LMA Source
Densities**



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GOES-R Proving Ground – Current Activities

2010

Product demonstration and support at the HWT/EWP Spring Experiment

- pseudo-GLM product
- lightning threat forecast in NSSL WRF
- Support aviation weather AWG through distribution of official CI product to SPC

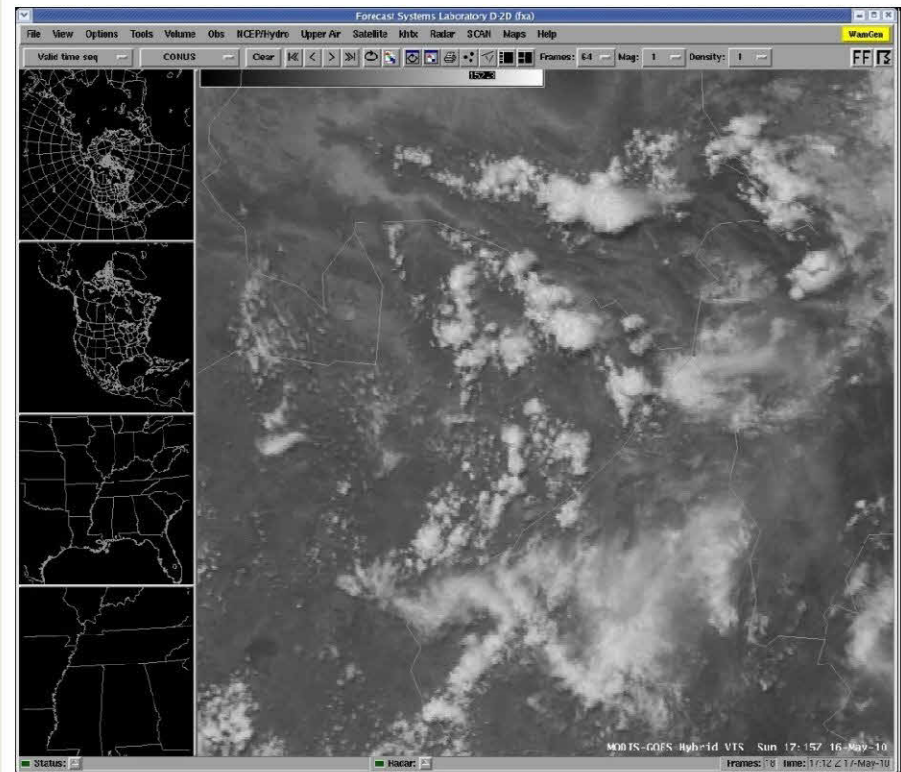
Training

- Development of pseudo-GLM WES Cases
- Total Lightning Training Module Development

Testing and distribution of ABI proxy cloud and moisture imagery and products via MODIS/GOES hybrid

Evaluation of ABI-like Fog/Low Cloud product via MODIS Data during Intensive Observing Periods

- selected WFOs
- survey and assessment



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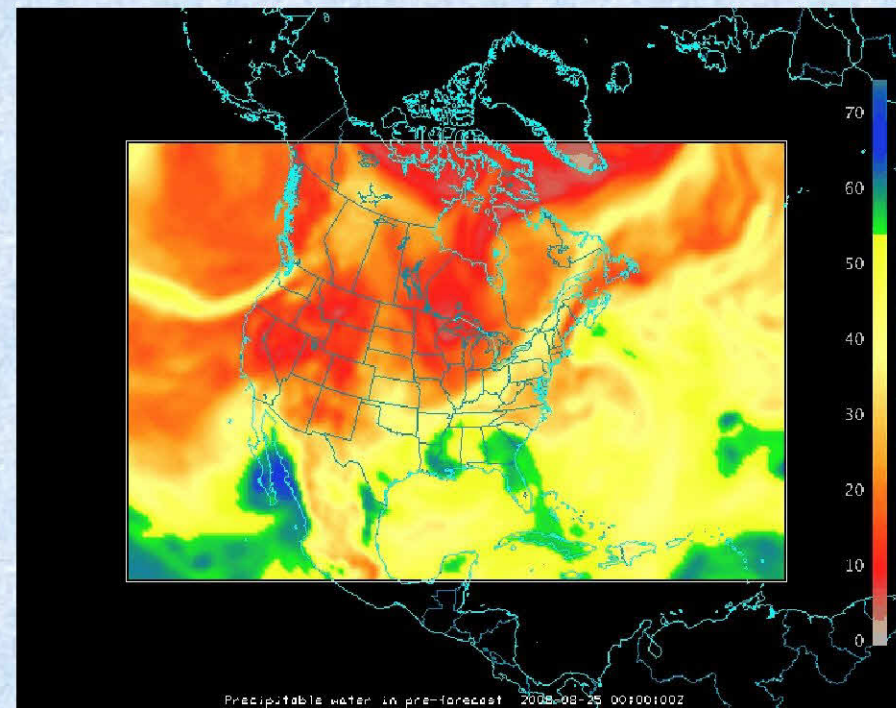
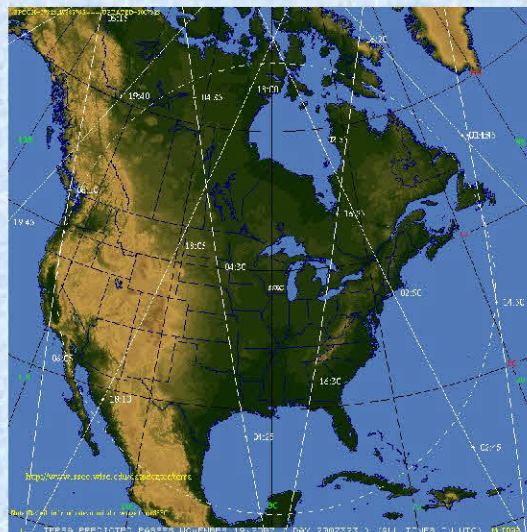
Can CRAS be configured to assimilate MODIS from direct broadcast sites around the world?



CIMSS has configured a version of CRAS that assimilates products from the Moderate Resolution Imaging Spectroradiometer (MODIS). It is installed at MODIS direct broadcast sites and assimilates MODIS products generated locally using IMAPP.

DBCAS was tested using MODIS direct broadcast products from the antenna at the Space Science and Engineering Center, University of Wisconsin, Madison.

TERRA Orbital Tracks



12-hour loop of total precipitable water (TPW) from the Direct Broadcast CRAS (DBCAS) spin-up forecast illustrating how MODIS moisture modifies the GFS water vapor in CRAS. Note how MODIS adds detail to the TPW in the vicinity of Tropical Storm Fay.

Integrating SPoRT Products into AWIPS II

Continuity in use of unique NASA research capabilities into the AWIPS II era
Help guide use of AWIPS II environment to address forecast problems

AWIPS II paradigm

- All data types require plug-ins to read and ingest files sent to AWIPS II
 - EDEX plug-in writes data to Postgres database, and HDF storage (if needed, e.g. for imagery)
 - a visualization plug-in is needed to view data with CAVE (Common AWIPS Visualization Environment)
- SPoRT has developed and will continue to develop functional plug-ins to support its product application and display
- AWIPS II will allow greater opportunities for user created displays which interact with AWIPS II data



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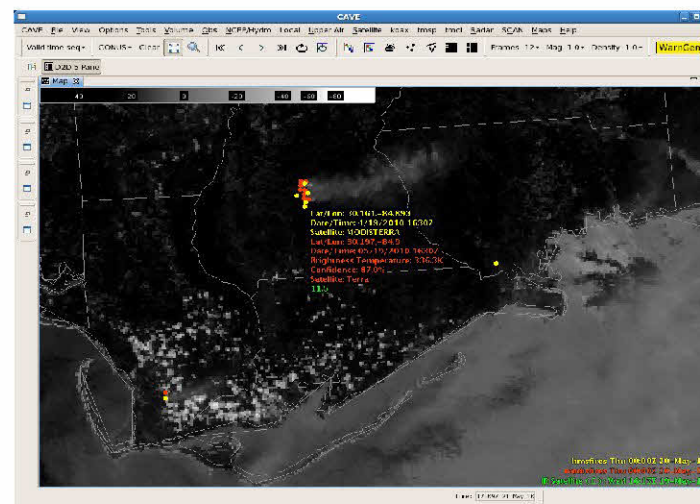


Product Examples in AWIPS II

Satellite image data

Use of SPoRT McIDAS area EDEX plug-in for satellite image data provides controllable flexibility in data type ingest

Additional CAVE plug-in for MCIDAS area data gives full control over display of data

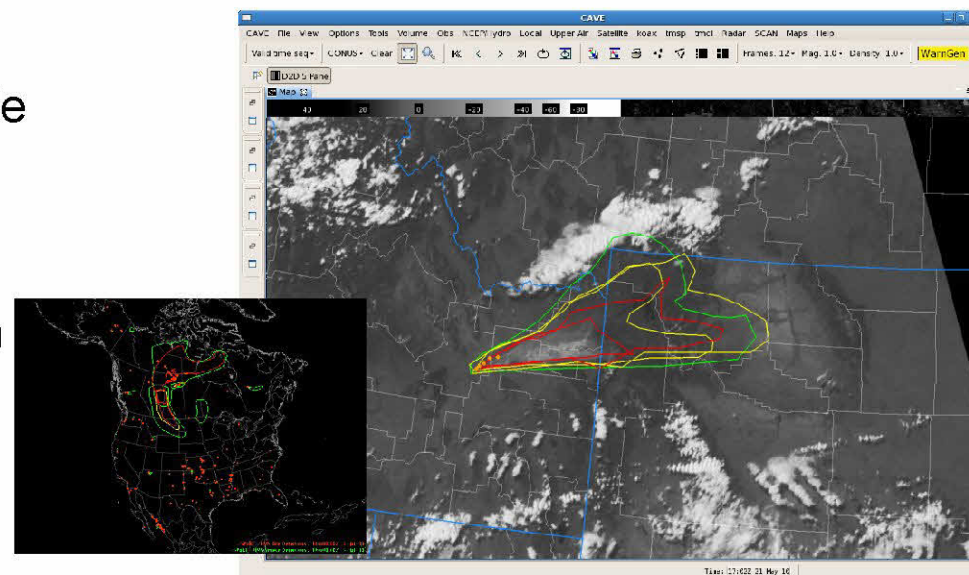


MODIS and derived hot spot data in AWIPS II

Point data and shape files

Specific EDEX/CAVE plug-ins provide control of meta data in EDEX and displayed in CAVE

Examples show NESDIS HMS hot spot and smoke shape file data with high resolution MODIS imagery



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Product Examples in AWIPS II

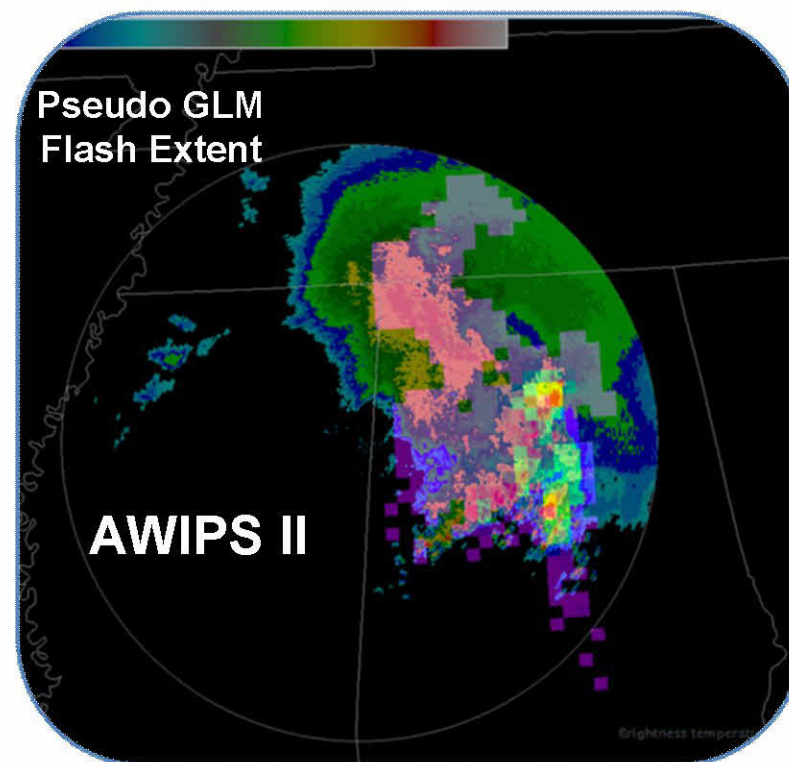
Pseudo GLM flash extend product

GRiB2 data format

Brought into Postgres data base with standard EDEX plug-in for GRIB data

Displayed with other data sources as layers

- looping capabilities
- fade in and out
- interrogate data under cursor



Radar reflectivity combined with pseudo GLM flash extent product in the AWIPS II environment

A small inset image showing a dark, textured surface, likely a satellite image of a storm or cloud system, with some bright, pixelated areas indicating flash extent.

Pseudo GLM
with 500 m
Visible MODIS

Future SPoRT AWIPS II Development

Continuity in use of unique NASA data and products into the AWIPS II era

Advanced display and data integration capabilities to better visualize data

- Image data
 - refine McIDAS AREA EDEX plug-in for multi-byte data
 - develop specific CAVE plug-ins for multi-byte data
 - new visualization plug-ins for unique imagery and displays (e.g., RGB)
 - develop capability to access data from web mapping services (WMS) for on-demand access to subsets of high resolution data
 - not all data available via SBN
 - addresses limited bandwidth issues at WFOs
 - access to new experimental data from within AWIPS II
- New products
 - New EDEX and CAVE plug-ins to support new data types as needed to address forecast issues and problems
- Advanced displays
 - CAVE plug-ins for 3D displays integrating EDEX data sets
 - lighting and radar, satellite and model data, etc.

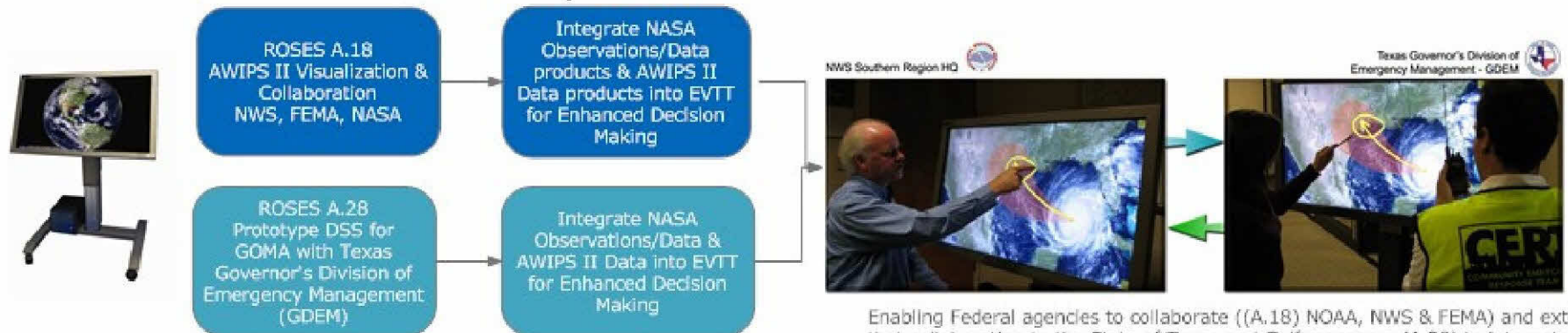


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Inter-office / Inter-agency Collaboration

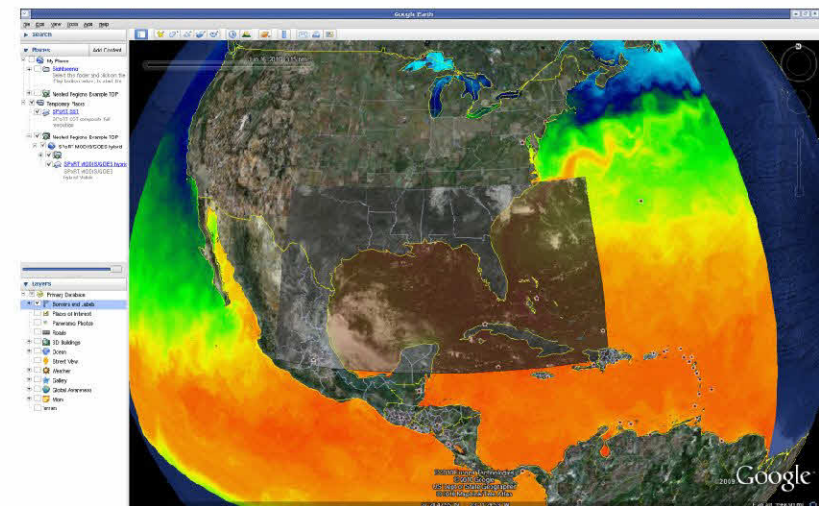
Use of SPoRT Data in EVTT / EVCM



Enabling Federal agencies to collaborate ((A.18) NOAA, NWS & FEMA) and extend that collaboration to the State of Texas and Gulf managers (A.28) to integrate critical storm surge, localized sea level rise and subsidence information from NASA as a pilot DSS for the rest of the GOMA

Partner with Dave Jones of Storm Center Communications in NASA / ROSES activity to integrate SPoRT data and products into the into the EnviroVision Touch Table (EVTT) collaboration environment and EnVirocast Collaboration Module (EVCM)

- natural disaster preparedness and warning
- Gulf of Mexico Alliance (GOMA) partners and Texas Governors Division of Environmental Management
- FEMA / NWS SR



Wrappers for GoogleEarth displays of NASA data

New collaboration with Alaska to bring EVCM capability and SPoRT data to the region



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